Opportunities and Risks of the Digital Sharing Economy for Sustainability

Pouri, Maria

Abstract: In recent years, there has been a rapid growth in the use of digital sharing platforms by individuals and also companies in various sectors. These platforms – such as Uber, Airbnb, Couchsurfing, BlaBlaCar, and many others – are predominantly associated with the sharing economy phenomenon. It is envisioned that in the coming years, the proliferation of platforms in the area of sharing economy will reach a point where it will eventually become a crucial, inevitable part of the global economy. Sharing platforms appear to have been more attractive in the eyes of consumers because they offer a wide variety of services that are often more affordable, efficient, convenient, and accessible than their counterparts in the conventional market. Nevertheless, the growth of the digitally enabled sharing economy can have both positive and negative effects from a sustainability perspective. In the technical sense of sharing, potential positive impacts take place as consumption processes are optimized through higher utilization of resources. From a social aspect, sharing enhances consumers' collaboration and cooperation in providing access to resources, particularly in the case of consumer-to-consumer sharing models. However, a more critical insight can reveal risks of digital sharing for sustainability as well: For example, rebound effects – which occur as a result of increase of efficiency in consumption – and increasing inequality and discrimination in the social and economic practices promoted by platforms. It is, therefore, of utmost importance to reflect on the potential impacts of the digital sharing economy for sustainability.

Originally published at:
Pouri, Maria (2020). Opportunities and Risks of the Digital Sharing Economy for Sustainability. In: Sharing Cooperativism: Designing For Economies, online, 26 October 2020, NordiCHI.

Opportunities and Risks of the Digital Sharing Economy for Sustainability

Maria J. Pouri

Department of Informatics, University of Zurich, Switzerland, pouri@ifi.uzh.ch

MOTIVATION

In recent years, there has been a rapid growth in the use of digital sharing platforms by individuals and also companies in various sectors. These platforms – such as Uber, Airbnb, Couchsurfing, BlaBlaCar, and many others – are predominantly associated with the *sharing economy* phenomenon. It is envisioned that in the coming years, the proliferation of platforms in the area of sharing economy will reach a point where it will eventually become a crucial, inevitable part of the global economy [1].

Sharing platforms appear to have been more attractive in the eyes of consumers because they offer a wide variety of services that are often more affordable, efficient, convenient, and accessible than their counterparts in the conventional market. Nevertheless, the growth of the digitally enabled sharing economy can have both positive and negative effects from a sustainability perspective [2, 3]. In the *technical* sense of sharing, potential positive impacts take place as consumption processes are optimized through higher utilization of resources. From a *social* aspect, sharing enhances consumers' collaboration and cooperation in providing access to resources, particularly in the case of consumer-to-consumer sharing models. However, a more critical insight can reveal risks of digital sharing for sustainability as well: For example, rebound effects – which occur as a result of increase of efficiency in consumption – and increasing inequality and discrimination in the social and economic practices promoted by platforms. It is, therefore, of utmost importance to reflect on the potential impacts of the digital sharing economy for sustainability.

BACKGROUND

The Digital Sharing Economy

The digital transition of society, or digitalization, can change patterns of consumption and production as well as social and economic structures. A use case of digital information and communication technology (ICT) is the digital sharing economy (DSE) whereby new patterns and practices of sharing have emerged via the application of ICT-enabled platforms. By definition, the DSE is "*A class of resource allocation systems based on sharing practices which are coordinated by digital online platforms and performed by individuals and possibly (non-) commercial organizations with the aim to provide access to material and immaterial resources. Digital sharing systems operate in the space between traditional sharing and the formal economy*" [4, p. 2].

The underlying notion of this definition is that the digital transition of sharing has removed the constraints of time, place, participation, communication, and coordination of traditional sharing and scaled up sharing practices via the application of online digital platforms. In other word, digitalization has been the enabler and catalyst for dealing with a growing variety of sharable resources [5, 6] (what can be referred to as the digital transformation of the *technical* aspect of sharing) to make sharing possible beyond the limits of small groups and personal relationships (what can be referred to as the digital transformation of the *social* aspect of sharing). Prior research has laid out these *transitional modifications* to sharing in the DSE [4]: The primary function of digitally enabled sharing systems has turned to be providing access to resources rather than practicing sharing as a prosocial behavior that contains normative presuppositions, such as sharing should be an act of solidarity. From this perspective, it is essential to maintain a neutral stance in describing the numerous variants and instances of the DSE and to strictly separate the analysis from applying normative principles.

Such principles should be based on explicit ethical viewpoints and be applied after a thorough descriptive analysis has been done. An example of explicit criteria for a normative assessment can be the UN sustainable development goals that address a normative framework for achieving sustainability.

Sustainability

Focusing on the concept of sustainability, the original Brundtland definition can present a valuable insight: Sustainable development is "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" [7]. While there exists a variety of frameworks that are based on the so-called "three pillars" or "dimensions" of sustainability (namely the social, environmental, and economic dimensions), some studies tend not to use these frameworks because they suggest an ontology in which the economic system seems to exist outside society and human society outside nature [2,4]. In contrast, the economic system can be viewed as a part of human society and human society as a part of nature. Based on this viewpoint, the sustainability of an action is determined by two types of interaction: First, the interaction between technosphere and the biosphere, i.e. the use of natural resources and ecosystem services; second, the interaction between humans, including social practices and economic transactions [4].

This conceptualization accords with Raworth's "Doughnut model" in which the concepts of planetary and social boundaries are combined in the analysis of sustainable development whereby "the needs of people are met without overshooting Earth's ecological ceiling." [8]. This and similar approaches can be applied to an analysis of the sustainability impacts of the DSE from two main aspects: The *technical* aspect and the *social* aspect.

ANALYSIS

It is essential to bear in mind that how designing a particular sharing system can affect sustainability. The (potential) impacts of digital sharing systems on sustainability are resulted from changes in consumption patterns (changes from the *technical* aspect) and in social and economic structures (changes from the *social* aspect). An integrative assessment of these two approaches can complete the picture of the sustainable design of sharing platforms.

The potential impacts of shared consumption promoted by digital platforms can be structured as follows [9, 10]:

Optimization effect: Sharing reduces the use of a resource by optimizing a process.
Induction effect: Sharing stimulates the consumption of another resource.
Substitution effect: The shared resource replaces the use of another resource.
Rebound effect: Increased resource efficiency is cancelled out by an increase in demand.
Degradation effect: Higher utilization of the shared resource leads to faster degradation.

From a socio-economic perspective, important considerations are towards impacts on welfare and income, workers, social life and relationships, and equality [11-13]. Different sharing systems may have different socio-economic implications in the sense of how sharing practices can affect participants' social and economic position. Especially with respect to the consumer-to-consumer and business-to-consumer sharing business models – which are highly popular – it is important to reflect on whether platforms can enhance equal access to markets, opportunities for participation in social life, protected work, and improved labor conditions. Table 1 shows an overview of potential sustainability impacts of the DSE on consumption and society.

Table 1. Opportunities and risks of consumer-to-consumer and business-to-consumer sharing business models for sustainability from the resource and socio-economic perspectives (source: [4]).

	Sustainability-relevant Aspect	Opportunities for Sustainability	Risks for Sustainability
Resource Perspective	Life cycle of …		
	1. Shared resource	Optimization of consumption	Faster resource degradation
	2. Complementary resources	Positive induced consumption	Negative induced consumption
	3. Substituted resources	Positive substitution effect	Negative substitution effects
			Direct rebound effects
			Indirect rebound effects
Socio-economic Perspective	Distinction between …		
	1. Not-for-profit C2C sharing	Social and economic welfare	Unregulated markets
	2. Capital-based C2C sharing	Extra income	Unprotected labor
	3. Labor-based C2C sharing	Social cohesion	(Quasi-) Sharing monopolies
	4. Not-for-profit B2C sharing	Formation of new social connections	Discrimination
	5. For-profit B2C sharing		Disruptive effect on businesses and workers in the formal economy

DISCUSSION

Whether designing a sharing business model will help promoting responsible, sustainability-oriented activities in the DSE requires a critical, integrative assessment of the impacts on consumption patterns and society. In the context of the technical aspect of sharing, the following concerns need contemplation [5, 14]:

- Not only the shared resource itself, but also coupled consumption activities should be taken into account. A thorough assessment – i.e. an assessment based on all resources that are needed to produce the final service – may reveal that optimizing the use of one of them at the cost of increasing the use of others does not contribute to a sustainable consumption.
- It may happen that the saved material, energy, time, and cost stimulate the demand to an extent that counterbalances the theoretical savings (the case of direct rebound) or that savings are spent for other consumption (the case of indirect rebound). Therefore, the net effect of sharing on resource consumption depends on the extent of the rebound effects pertaining to the specific case.
- The effects of substituted consumptions can have different implications for sustainability depending on whether the new consumption choice(s) would substitute for higher- or lower-impact options.
- Investments in additional assets for profit-oriented sharing may indicate strong rebound effects. For the investments to be profitable, demand should increase. Although commercial platforms would welcome this as the growth of their business, from a sustainability perspective, increasing demand may lead to faster resource depletion.

Some important questions that can be raised with respect to the social impacts of the DSE are:

- To what extent will a platform and its services contribute to equal opportunities for everyone to participate in a given market or community?
- To what extent can a platform affect the businesses and their workers in the conventional market?
- To what extent can a platform affect people's life in the local ecological and social environment in which they operate?

– How the design of a sharing system and its services can support the development of social norms, institutions, and policies that are conducive to sustainability?

CCS CONCEPTS

• Information Systems → Information systems applications → Collaborative and social computing systems and tools • Social and Professional Topics → Professional topics → Computing and business → Economic impact • Social and Professional Topics → Professional topics → Computing and business → Socio-technical Systems

KEYWORDS

Information and communication technology (ICT), Digital sharing economy, Sharing platforms, Sustainability impacts, Resource consumption, Socio-economic structures, Social sharing, Technical sharing.

REFERENCES

[1] Yaraghi, N. and Ravi, S., 2017. The current and future state of the sharing economy. Available at SSRN 3041207.

[2] Pouri, M.J. and Hilty, L.M., 2018. Conceptualizing the digital sharing economy in the context of sustainability. Sustainability, 10(12), p.4453.

[3] Pouri, M.J. and Hilty, L.M., 2018. ICT-enabled sharing economy and environmental sustainability—a resource-oriented approach. In Advances and New Trends in Environmental Informatics (pp. 53-65). Springer, Cham.

[4] Pouri, M.J. and Hilty, L.M., 2020, June. The Relevance of Digital Sharing Business Models for Sustainability. In Proceedings of the 7th International Conference on ICT for Sustainability (pp. 77-87).

[5] Fedosov, Anton, Jeremías Albano, and Marc Langheinrich. "Supporting the design of sharing economy services: learning from technology-mediated sharing practices of both digital and physical artifacts." In Proceedings of the 10th Nordic Conference on Human-Computer Interaction, pp. 323-337. 2018.

[6] Ryynänen, T.T. and Hyyryläinen, T.T., 2018, March. Digitalisation of Consumption and Digital Humanities: Development Trajectories and Challenges for the Future. In DHN18 DHN 2018: Proceedings of the Digital Humanities in the Nordic Countries 3rd Conference, Helsinki, Finland, March 7-9, 2018. University of Helsinki.

[7] World Commission on Environment and Development (WCED). World Commission on Environment and Development: Our Common Future; Oxford University Press: Oxford, UK, 1987.

[8] Raworth, K. 2017. Doughnut economics: seven ways to think like a 21st-century economist. Chelsea Green Publishing.

[9] Hilty, L.M. and Aebischer, B. 2014. ICT for Sustainability: An Emerging Research Field. Advances in Intelligent Systems and Computing ICT Innovations for Sustainability (July 2014), 3–36.

[10] Weber, T.A. 2018. The Dynamics of Asset Sharing and Private Use. In Proceedings of the 51st Annual Hawaii International Conference on System Sciences (HICSS), Waikoloa Village, HI, USA, 3–6 January 2018; pp. 5205– 5211.

[11] Schor, J.B. and Attwood-Charles, W. 2017. The "sharing" economy: labor, inequality, and social connection on for-profit platforms. Sociology Compass 11, 8 (2017)

[12] Frenken, K. and Schor, J. 2017. Putting the sharing economy into perspective. Environmental Innovation and Societal Transitions 23 (2017), 3– 10.

[13] Hagiu, A. and Wright, J. 2019. The status of workers and platforms in the sharing economy. Journal of Economics & Management Strategy 28, 1 (2019), 97–108.

[14] Pouri, M.J. and Hilty, L.M., 2020. Digitally Enabled Sharing and the Circular Economy: Towards a Framework for Sustainability Assessment. In *Advances and New Trends in Environmental Informatics* (pp. 105-116). Springer, Cham.